PALADIN: Prompt-Aligned Localization and Anomaly Detection with DINOv3

Supplementary Material

1. Template Construction for Normal and Abnormal Prompt

To generate natural language prompts for both **normal** and **abnormal** instances across all categories, we follow a structured template-based approach. The prompts are designed to support fine-grained understanding by large vision-language models, while remaining consistent and contextually descriptive.

Base Templates

We use the following base templates to frame prompts for each object:

- `"a photo of a {}."`
- `"a photo of the {}."`

Here, {} is replaced with either a *normal phrase* or an *abnormal phrase*, as defined below.

Normal Phrases

To describe normal (defect-free) objects, we generate prompts by inserting the following variants of object descriptions into the base templates:

- `{obj}`
- `flawless {obj}`
- `perfect {obj}`
- `unblemished {obj}`
- `{obj} without flaw`
- `{obj} without defect`
- `{obj} without damage`

For example, for the object class “tile”, we generate normal prompts like:

- `"a photo of a flawless tile."`
- `"a photo of the tile without damage."`

Abnormal Phrases

To describe abnormal (defective) instances, we create fine-grained descriptions using the following format:

- `{obj} with {fine-grained abnormality description}`

The fine-grained abnormality descriptions in Tables 1 and 2 are created with GPT-4o. These descriptions highlight specific defects or irregularities associated with the object. For example, for the class ”tile”, an abnormal phrase may be:

- `"tile with chipped edges"`
- `"tile with fungus"`

These phrases are then inserted into the base template, yielding prompts such as:

- `"a photo of a tile with chipped edges."`
- `"a photo of the tile with fungus."`

Prompt Generation Strategy

For each object class:

1. All normal phrases are applied to the object name to generate normal prompts.
2. Each abnormal description (from the tables below) is paired with the object name to create abnormal phrases.
3. These phrases are inserted into both base templates to create the final prompt set.

This results in a diverse and comprehensive set of natural language prompts capturing both normal and defective cases with detailed semantic granularity.

Table 1. Class-Specific Abnormal Descriptions for MVTec

Class	**Abnormal Descriptions**
Carpet	discoloration in a specific area; irregular patch or section with a different texture; frayed edges or unraveling fibers; burn mark or scorching
Grid	crooked; cracks; excessive gaps; discoloration; deformation; missing; inconsistent spacing between grid elements; corrosion; visible signs; chipping
Leather	scratches; discoloration; creases; uneven texture; tears; brittleness; damage; seams; heat damage; mold
Tile	chipped; irregularities; discoloration; efflorescence; warping; missing; depressions; lippage; fungus; damage
Wood	knots; warping; cracks along the grain; mold growth on the surface; staining from water damage; wood rot; woodworm holes; rough patches; protruding knots
Bottle	cracked large; cracked small; dented large; dented small; leaking; discolored; deformed; missing cap; excessive condensation
Cable	twisted; knotted cable strands; detached connectors; excessive stretching; dents; corrosion; scorching along the cable; exposed conductive material
Capsule	irregular shape; discoloration coloring; crinkled; uneven seam; condensation inside the capsule; foreign particles; unusually soft or hard
Hazelnut	fungal growth; unusual discoloration; rotten; insect infestation; wetness; misshapen shell; unusually thin; contaminants; unusual texture
Metal nut	cracks; irregular threading; corrosion; missing; distortion; signs of discoloration; excessive wear on contact surfaces; inconsistent texture
Pill	irregular shape; crumbling texture; excessive powder; uneven coating; presence of air bubbles; disintegration; abnormal specks
Screw	rust on the surface; bent; damaged threads; stripped threads; deformed top; coating damage; uneven grooves; inconsistent size
Toothbrush	loose bristles; uneven bristle distribution; excessive shedding of bristles; staining on the bristles; abrasive texture; irregularities in the shape
Transistor	burn marks; detached leads; signs of corrosion; irregularities in the shape; presence of cracks or fractures; signs of physical trauma; irregularities in the surface texture
Zipper	bent; frayed; misaligned; excessive stiffness; corroded; detaches; loose; warped

Table 2. Class-Specific Abnormal Descriptions for VisA

Class	Abnormal Descriptions
candle	cracks or fissures in the wax; wax pooling unevenly around the wick; tunneling; incomplete wax melt pool; irregular or flickering flame; extra wax in candle; wax melted out of the candle
capsules	uneven capsule size; capsule shell appears brittle; excessively soft; dents; condensation; irregular seams or joints; specks
cashew	uneven coloring; fungal growth; presence of foreign objects; unusual texture; empty shells; signs of moisture; stuck together
chewinggum	consistency; presence of foreign objects; uneven coloring; excessive hardness; similar color spot
fryum	irregular shape; uneven coloring; unusual texture; small scratches; different color spot; fryum stuck together
macaroni1	uneven shape; small scratches; small cracks; uneven coloring; signs of insect infestation; uneven texture; unusual consistency
macaroni2	irregular shape; small scratches; presence of foreign particles; excessive moisture; signs of infestation; small cracks; unusual texture
pcb1	oxidation on the copper traces; separation of layers; presence of solder bridges; excessive solder residue; discoloration; uneven solder joints; bowing of the board; missing vias
pcb2	oxidation on the copper traces; separation of layers; presence of solder bridges; excessive solder residue; discoloration; uneven solder joints; bowing of the board; missing vias
pcb3	oxidation on the copper traces; separation of layers; presence of solder bridges; excessive solder residue; discoloration; uneven solder joints; bowing of the board; missing vias
pcb4	oxidation on the copper traces; separation of layers; presence of solder bridges; excessive solder residue; discoloration; uneven solder joints; bowing of the board; missing vias
pipe fryum	uneven shape; presence of foreign objects; different color spot; empty interior; unusual texture; similar color spot; stuck together